KINGSTON TECHNOLOGY
FAST ETHERX STACKABLE
8-PORT, 12-PORT, & 24-PORT
100BASE-TX 19" RACK-MOUNTABLE
FAST ETHERNET HUBS
USER'S GUIDE

MODELS: KNE8TX/RS
KNE12TX/RS
KNE24TX/RS

Kingston Technology's

Fast EtheRx Stackable

8-Port, 12-Port, and 24-Port 100BASE-TX 19" Rack-Mountable Fast Ethernet Hubs

User's Guide

Part No. 4460051-001.A01

Kingston Technology Company
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Fountain Valley, CA 92708
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Important Safety Instructions

1. Read all these instructions.
2. Save these instructions for later use.
3. Follow all warnings and instructions marked on the product.
4. Do not use this product near water.
5. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
6. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risk. Refer all servicing to service personnel.

Wichtige Sicherheitshinweise

1. Diese Hinweise sollten vollständig durchgelesen werden.
2. Diese Hinweise für einen späteren Gebrauch aufbewahren.
3. Allen auf dem Gerät angebrachten Warnungen und Hinweisen folgen.
4. Das Gerät nicht in der Nähe von Wasser verwenden.
5. Das Gerät nur mit dem Aufkleber bezeichneten Netzspannung betreiben. Bei Fragen über die Art der Netzspannung sollte der Händler oder das Energieversorgungsunternehmen zu rate gezogen werden.
6. Nicht versuchen das Produkt selbst zu reparieren. In allen Produkten existieren gefährliche elektrische Spannugen. Nicht das Gehäuse öffnen.

TABLE OF CONTENTS

Introduction

Intended Audience: This manual assumes that the user has a general working knowledge of networking principles and its architecture.

Congratulations on the purchase of your Kingston Fast EtheRx Stackable 100BASE-TX 19" Rack-Mountable Fast Ethernet Hub. There are three models available: KNE8TX/RS, KNE12TX/RS, and KNE24TX/RS, 8-Port, 12-Port, and 24-Port Fast Ethernet hubs, respectively. The Fast EtheRx models are 100BASE-TX Class Ⓘ and Class Ⓘ compliant repeaters which conform to IEEE 802.3u 100Mb/s CSMA/CD (Carrier Sense Multiple Access with Collision Detection) networks using Category 5 Unshielded Twisted Pair (UTP) cabling. There is also an optional 100BASE-FX plug-in module available for either SC or ST-type connectors. The Fast EtheRx 100BASE-TX hubs operate at 100Megabits per second (Mbp/s) out-performing standard 10BASE-T Ethernet 10Mb/s operation by up to 10 times faster.

The Fast EtheRx hubs offer eight (8), twelve (12), or twenty-four (24) UTP ports for 100BASE-TX Fast Ethernet connections. The last UTP port offers two RJ-45 connectors to support both crossover or straight-through cable wiring for uplinking to one other 100BASE-TX Class Ⓘ repeater. The Fast EtheRx hubs can also be stacked (using any combination of these 3 models) up to six hubs using the stacking cable provided. This allows a maximum of 48, 72, or 144 UTP ports (depending on the model) on a single collision domain. The Fast EtheRx hubs can be used on desktop or 19-inch rack-mount installations (mounting hardware included). For easy trouble-shooting, the front panel includes a variety of diagnostic LEDs including: Power, Collision, Utilization and UTP port LEDs which display Link, Activity and Partition/Error status.

For the remainder of this manual, the Fast EtheRx Stackable Fast Ethernet Hubs will be referred to collectively as the Fast EtheRx Hubs. For clarity, the three models will be differentiated as follows:

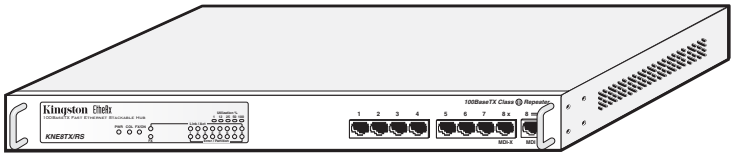
- KNE8TX/RS – Fast EtheRx Stackable 8-Port Fast Ethernet hub
- KNE12TX/RS – Fast EtheRx Stackable 12-Port Fast Ethernet hub
- KNE24TX/RS – Fast EtheRx Stackable 24-Port Fast Ethernet hub

Order Information

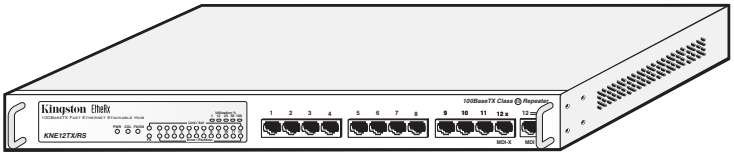
The Fast EtheRx hubs support optional Fiber Optic plug-in modules which can be ordered for future upgrading by the following part numbers:

Accessories	
Part No.	**Descriptic**
KNE100FX/RSC	*Optional* 100BASE-FX Fiber Optic Plug-In Module with SC (Subscriber Connect) connectors
KNE100FX/RST	*Optional* 100BASE-FX Fiber Optic Plug-In Module with ST (Straight Tip) connectors

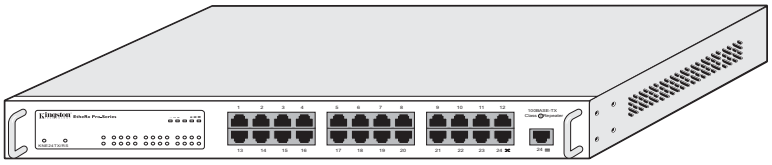
Model Types



Fast EtheRx KNE8TX/RS
8-Port Model



Fast EtheRx KNE12TX/RS
12-Port Model



Fast EtheRx KNE24TX/RS

Special Features

- 100BASE-TX Class Ⅰ or Class Ⅱ compliant repeater
- Stack up to **six** Fast EtheRx hubs to create a single repeater unit
- 8, 12, or 24 UTP ports for 100BASE-TX connection
- 8, 12, or 24 Link, Activity, and Partition/Error Status LEDs for easy troubleshooting
- Optional 100BASE-FX modules available (SC or ST connectors)
- Utilization LEDs display network traffic in five LED percentage levels
- Power LED and Collision LED for collision detection
- Automatic partition and reconnection
- Uplink Ports support both crossover and straight-through cable wiring for cascading to another 100BASE-TX Class Ⅱ repeater
- Conforms to IEEE 802.3u 100BASE-TX standard and Repeater for 100Mb/s baseband networks
- Internal auto-sensing universal power supply operating at 100-240VAC (50/60Hz)
- 19-inch Rack Mountable with mounting kit included

Package Contents

Your Fast EtheRx Stackable package should contain the following items:

- Fast EtheRx Stackable 8-, 12-, or 24-Port Fast Ethernet Hub
  KNE8TX/RS or **KNE12TX/RS** or **KNE24TX/RS**
- 50-pin shielded stacking cable
- AC power cord
- Mounting kit includes:
  (2) Angle brackets
  (8) Bracket mounting screws
  (4) 10/32” Rack-Mount screws
  (4) Rubber Feet
- User's Guide

If any of the items are missing or damaged, please contact your Kingston dealer for a replacement. Be sure the items you receive are genuine Kingston Technology products. If the Kingston name and logo are not on the front panel of your unit, it’s not a genuine Kingston product.

Design Features

The Fast EtheRx 100BASE-TX hubs comply with the full set of repeater functions as defined by IEEE 802.3u, clause 27. These functions include all Repeater Functions, Signal Regeneration, Jabber Lockup Protection, Collision-Handling, Error-Handling, and Auto Partitioning/Reconnection. These functions are usually transparent to all network activities and are summarized below.

Repeater Functions

If any single port senses the start of a valid packet on its receiving line, the Fast EtheRx hub will re-transmit the received data to all other ports on the network. The retransmission of packets complies with the IEEE 802.3u specification in terms of preamble structure, voltage amplitude, and timing characteristics. These timing regeneration's prevent cumulative signal loss, jitter, and distortion caused by the network cabling, and allow the Fast EtheRx Hubs to be uplinked to another 100BASE-TX switching hub or cascaded to other Class Ⅱ Repeater.

Jabber Lock-up Protection

The Fast EtheRx hubs implement a built-in jabber protection scheme to ensure that the network is not disabled due to transmission of excessively long data packets. This protection scheme will automatically interrupt the reception of abnormally long streams of data to prevent jabber lock-up.

Collision-Handling

The Fast EtheRx hubs will perform collision detection and respond to collision conditions as defined in the IEEE 802.3u specifications.

Error-Handling

With 100BASE-TX Fast Ethernet, the new error-handling feature prevents sub-standard links from generating streams of false carrier and interfering with other links.

Automatic Partitioning / Reconnection

If any of the ports on the Fast EtheRx Hub experience excessive numbers of consecutive collisions, duration collisions, or faulty conditions, that particular port can be partitioned. Once partitioned, the hub will continue to monitor that port. If the error conditions have been corrected or a good data packet is transmitted without incurring a collision, the hub will automatically reconnect that port to the network.

Hardware Installation

Before you begin installing network cables, please take a few moments to familiarize yourself with the front panel of your Fast EtheRx Hub. The functions on the front and rear panels are illustrated below.

Front Panel

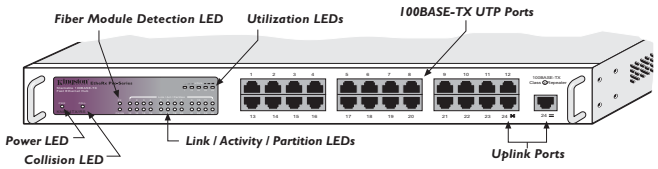


Fig. 1. Front Panel - 24-Port Model

Power LED

The green LED indicates the power status. The LED will light when the AC power cord is connected from a power source to the hub and the power switch is turned on.

Collision LED

The amber LED displays the collision status. If a collision is detected on the network, the amber LED will flash. For the Fast Ethernet CSMA/CD network, collisions can be quite common. A collision occurs when two or more stations try to transmit data simultaneously. Both stations will stop transmitting and then re-transmit after a random period of time.

Fiber Module Detection LED

The Fiber Module Detection LED will light up if the optional 100FX module is installed. This LED will not light up if the optional 100FX module is not installed.

UTP Port LEDs

The UTP Port LEDs indicate Link, Activity, Error, and Partition status. If a good link is established on any given port, the green LED will be continuously lit, indicating a valid network connection between the network node and the hub. When data is received, the LED will flash green. If the port is partitioned or encounters an error, such as jabber, false carrier, misalignment, or invalid packet, the LED will flash amber.

If an LED does not indicate a good link, check the following:

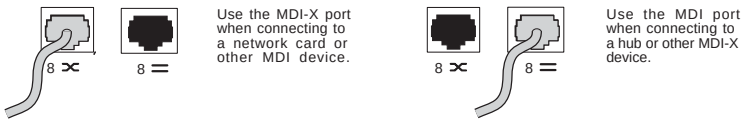
1. Make sure the power is turned on for both the PC and Fast EtheRx Hub. The power LED should be lit.
2. Verify the network drivers have been loaded on the PC. Some adapters require the drivers to be loaded to establish a proper link.
3. Make sure the cable is wired properly and connected on both ends.
4. If steps 1, 2, and 3 are correct, the cable may be defective or not wired correctly. Replace the cable and try again. Please refer to Appendix A for pin assignments and Appendix B for cabling guidelines.

Utilization LEDs

There are five utilization LEDs to display the amount of network traffic in five percentage levels. The amount of data traffic is measured in frames per second (FPS), then calculated into the following percentage forms: 1%, 12%, 25%, 50%, and 100%. The appropriate LED will light based on the network activity.

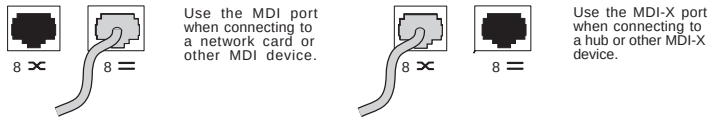
UTP and Uplink Ports

The UTP ports on the front panel, numbered 1 through 8 (KNE8TX/RS), 1 through 12 (KNE12TX/RS), or 1 through 24 (KNE24TX/RS), support 100BASE-TX connections. Since the crossover function is implemented on all UTP MDI-X ports, a straight-through cable should be used to connect to a workstation. The last UTP port on each model has two (2) RJ-45 connectors for support of cabling in the crossover and straight-through configuration. Only one of the two ports, MDI-X or MDI (or), may be used.



Using a Straight-Through Cable

Using a Crossover Cable



Notes on MDI and MDI-X Ports

MDI (Media Dependent Interface) is the standard that defines the mechanical and electrical configuration of a UTP port. For any two devices to communicate with each other on the network, the transmitter of one device must be connected to the receiver of the other device. This can be achieved by using a crossover cable, or by using the MDI-X port, which implements the crossover internally.

Ports 1 thru 7 (KNE8TX/RS), ports 1 thru 11 (KNE12TX/RS), and ports 1 thru 23 (KNE24TX/RS), like all normal hub ports, are configured as MDI-X. The last UTP port has two (2) RJ-45 connectors in order to support both MDI and MDI-X configurations for flexibility when uplinking to another Class Ⅱ repeater using either cable type. All NICs (Network Interface Cards) and Router ports are usually by default configured as MDI. A simple illustration shows the relationship of cable types to port types:

Port Connector	Port Config	For Connection to Another Hub Port (MDI-X)	For Connection to a Network Adapter or Router (MDI)
⨯	MDI-X	Use Crossover cable	Use Straight-through cable
=	MDI	Use Straight-through cable	Use Crossover cable

Table 1. Port Configurations

Rear Panel

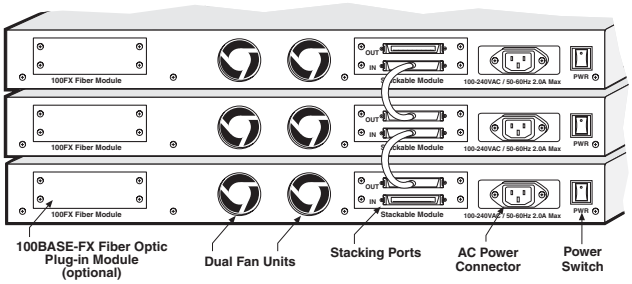


Fig. 2. Hub Rear Panels with Stacking Cables

Power Switch

The power switch toggles power on and off to the unit. The switch can also be used to reset the Fast EtheRx hub.

AC Power Connector

The Fast EtheRx hubs use an auto-sensing 100VAC-240VAC, 50/60Hz internal power supply. Connect the AC power cord from the rear of the unit to an AC electrical outlet.

☞ **WARNING: For safety reasons, DO NOT attempt to open and service the unit. There are no user-serviceable components inside.**

Fan Units

The Fast EtheRx hubs use two independent cooling fans for optimum air flow to safeguard the unit from unnecessary heat exposure.

100FX Fiber Module (Optional)

Kingston offers an optional plug-in module to support 100BASE-FX Fiber Optic cabling. There are two models to support both Straight-Tip (ST) and Subscriber Connect (SC) type connectors:

- **KNE100TX/RST** for ST connectors

- **KNE100TX/RSC** for SC connectors.

Stacking Fast EtheRx Hubs

The Fast EtheRx hubs use stacking ports located on the rear panel to stack up to six hubs in any combination of 8-Port, 12-Port, or 24-Port models. Follow the directions below to stack up to six hubs together:

1. Locate the 50-pin shielded stacking cable included with your package contents.
2. Plug one end of the cable into the port labeled, ***"Out"*** on the first hub.
3. Plug the other end of the cable into the ***"In"*** port on the second hub.
4. Connect the AC power cord to each hub, then flip the power switch to turn on power to the unit.
5. Repeat the process to stack additional hubs up to a maximum of six (6) hubs.

Figure 3 below illustrates the configuration for stacking six of the 12-port model hubs, expanding the total number of UTP port connections from 12 to 72 UTP ports, while still being recognized as one single repeater unit on the network. A maximum of six (6) Fast EtheRx hubs can be stacked in any combination of 8-, 12-, and 24-port models.

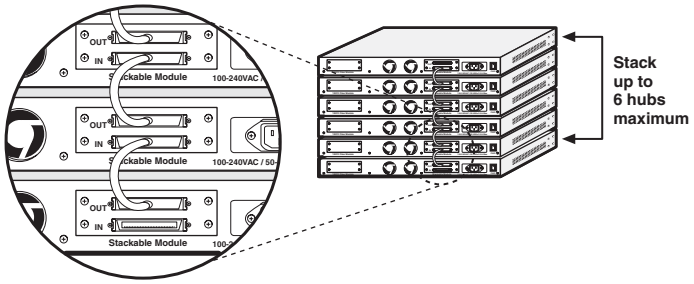


Fig. 3. Stacking Additional Hubs

Installing the 100FX Module (Optional)

Kingston offers two optional plug-in modules to support 100BASE-FX Fiber Optic cabling with either SC (Subscriber Connector) or ST (Straight Tip) connector types. Model KNE100FX/RSC supports SC-type connectors. Model KNE100FX/RST supports ST-type connectors.

To upgrade your Fast EtheRx Stackable Fast Ethernet hub with either of the 100BASE-FX plug-in modules, follow the directions below. The procedure requires a Philips head screwdriver.

1. Locate the faceplate labeled *"100FX Fiber Module"* on the rear panel of the hub.
2. Remove the four philips head screws to remove the faceplate.
3. Next, insert the plug-in module into the open slot. Press firmly to secure the module into the socket connector.
4. Re-install the four screws to secure the faceplate to the hub.
5. The FX/ON LED will display a solid light if properly installed.

Figure 4 below illustrates the KNE100FX/RSC with SC-type connectors installed into the rear panel of your EtheRx hub. Figure 5 shows the KNE100FX/RST with ST-type connectors installed.

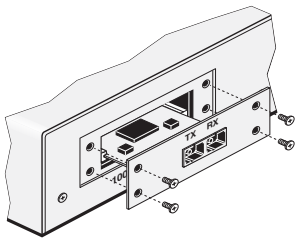


Fig. 4. Model KNE100FX/RSC with SC connectors

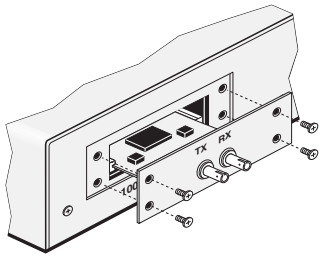


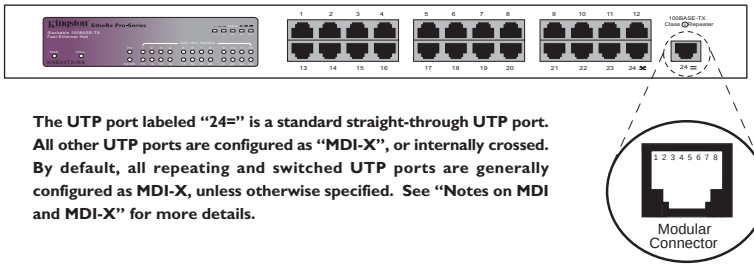
Fig. 5. Model KNE100FX/RST with ST connectors

Appendices

Appendix A Pin Assignments

UTP Port Pin Assignments

The UTP ports use RJ-45 Unshielded Twisted Pair (UTP) cabling. Connector pin numbers and pin wiring assignments are listed below in Figure A-1. Twisted-Pair cables can be wired with either straight-through or crossover pin assignments. Both wiring schemes are mentioned in *"Appendix B Cabling Guidelines"* for reference in creating a twisted-pair cable.



The UTP port labeled "24=" is a standard straight-through UTP port. All other UTP ports are configured as "MDI-X", or internally crossed. By default, all repeating and switched UTP ports are generally configured as MDI-X, unless otherwise specified. See "Notes on MDI and MDI-X" for more details.

Fig. A-1 RJ-45 Connector Pin Numbers

Pin Number	MDI-X	MDI
1	Receive Data +	Transmit Data +
2	Receive Data -	Transmit Data -
3	Transmit Data +	Receive Data +
4,5	Not Used	Not Used
6	Transmit Data -	Receive Data -
7,8	Not Used	Not Used

Table A-1 UTP Pin Assignments

Appendix B Cabling Guidelines

Cable Type

When connecting network cables, the following table shows appropriate cabling guidelines for 100BASE-TX Fast Ethernet architecture.

Ethernet Standard:	100BASE-TX
Trunk and Patch Cable Type:	4-Pair 100Ω UTP CAT 5 (only 2 pairs used)
Max. Cable Length: Hub to Workstation Hub to Hub	 100M (328ft) 5M (16.4ft)
Modular Plug:	8-Pin RJ-45 CAT 5 only
Patch Panel:	8-Pin RJ-45 CAT 5 only
Network Topology:	Star

Table B-1. Network Cable Guidelines

UTP Cable Wiring

100BASE-TX unshielded twisted-pair cables can be wired as "Straight-Through" or, in some cases, "Cross-Over" depending on the application. For workstations connected to a hub, use "Straight-Through' wiring illustrated below in Table B-2. In some instances (e.g. cascading from one hub to another), you may use "Cross-Over" wiring illustrated below in Table B-3.

"Straight-Through" Cable Wiring

Pin Number	Pin Number
1 (TRX +)	1 (TRX +)
2 (TRX -)	2 (TRX -)
3 (RCV +)	3 (RCV +)
6 (RCV -)	6 (RCV -)
4, 5, 7, 8	Not Used

Table B-2. Straight-Through Wiring

Crossover" Cable Wiring

Pin Number	Pin Number
1 (TRX +)	3 (RCV +)
2 (TRX -)	6 (RCV -)
3 (RCV +)	1 (TRX +)
6 (RCV -)	2 (TRX -)
4, 5, 7, 8	Not Used

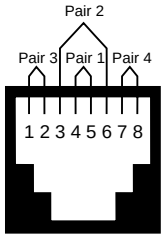
Table B-3. Cross Over Wiring

Cable Wiring Standards

There are two governmental agencies: the Electronic Industry Association (EIA) and the Telecommunications Industry Association (TIA), which set the standard for all cable wiring requirements for commercial buildings.

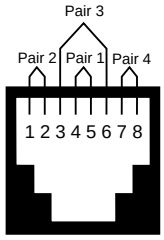
With the advent of 100Mb/s networking products, it is best to use higher quality CAT 5 cables like Belden or Helix as well as CAT 5-compliant patch panels, patch cables, and connectors while following the EIA/TIA wiring standards. 100 Ω UTP CAT 5 type cables use 4-pair UTP wiring.

Refer to the illustrations below for 4-pair 100Mb/s wiring using either T568A (Fig. B-1) or T568B (Fig. B-2) wiring standards. Both T568A and T568B wiring is compatible with 10BASE-T and 100BASE-TX and require no special configurations, but stick to one wiring standard. If your building is wired for T568A, any changes or additions must be done with the T568A wiring scheme. Mixing the T568A and T568B wiring schemes will not work.



T568A

Fig. B-1. 4-Pair T568A Wiring



T568B

Fig. B-2. 4-Pair T568B Wiring

T568A	Pairs	Strand	Solid
Pin 1	Pair 3	Blue	White/Green
Pin 2	Pair 3	Orange	Green/White
Pin 3	Pair 2	Black	White/Orange
Pin 4	Pair 1	Red	Blue/White
Pin 5	Pair 1	Green	White/Blue
Pin 6	Pair 2	Yellow	Orange/White
Pin 7	Pair 4	Brown	White/Brown
Pin 8	Pair 4	White	Brown/White

Table. B-4. 4-Pair T568A Wiring

T568B	Pairs	Strand	Solid
Pin 1	Pair 2	Black	White/Orange
Pin 2	Pair 2	Yellow	Orange/White
Pin 3	Pair 3	Blue	White/Green
Pin 4	Pair 1	Red	Blue/White
Pin 5	Pair 1	Green	White/Blue
Pin 6	Pair 3	Orange	Green/White
Pin 7	Pair 4	Brown	White/Brown
Pin 8	Pair 4	White	Brown/White

Table B-5. 4-Pair T568B Wiring

UTP Cable Rating Codes

UTP cables meet different UL-NEC requirements based mostly on cable-jacket quality. Below is an explanation of the rating codes for each cable type.

UL – The National Electrical Code (NEC), published by the National Fire Protection Association (NFPA), details advisory safety considerations for electrical wiring. NEC Article 800 Communications Cables are manufactured to meet these different cable types.

1. **CMP** – Cables meeting type CMP requirements are suitable for installation in ducts and plenums without the use of conduit. These cables are designed for fire resistance and low-smoke and toxin producing characteristics.
2. **CMR** – Riser type cables are engineered to prevent the spread of fire from floor to floor and are suitable for vertical shaft applications.
3. **CM** – Cables for general building wiring. CM cables are used in areas other than plenums and risers. These cables are resistant to the spread of fire and pass the UL 1581Vertical Tray Flame Test.
4. **MP, MPR** & **MPP** – Within Article 800, the Multi-purpose Cables Category, allows conditional substitutions between different cable types & are restricted by number, AWG size and stranding of the cable conductors.

Terms You Should Be Familiar With

1. **BACKBONE WIRING** – The physical/electrical interconnections between telecommunications wiring closets and equipment rooms.
2. **COMPLIANCE** – A datacomm or wiring device that meets all characteristics of a standard is said to be in compliance with that standard.
3. **PREMISE WIRING** – The entire wiring system on the premises, especially the supporting wiring that connects the communications outlets to the network interface jack.

4. **NEAR-END CROSSTALK (NEXT) –** In wires packed together within a cable, the signals generated at one end of the link can flush out the weaker signals coming back from the receiving end of the link.

Appendix C Specifications

Fast EtheRx Models: KNE8TX/RS, KNE12TX/RS	
Compliance:	IEEE 802.3u 100BASE-TX Standard for 100Mb/s baseband networks
Media Interface: KNE8TX/RS KNE12TX/RS	 8 UTP ports for 100BASE-TX connections 12 UTP ports for 100BASE-TX connections
Diagnostic LEDs:	8 or 12 LEDs for Link (Green) & Activity (flashing green) 8 or 12 LEDs for Partition (flashing Amber) 1 LED for Collision status (Amber) 1 LED for Power Indicator (Green) 5 LEDs Utilization Status (steady green) 1 LED for Fiber Module Detection (optional)
Connector Type:	RJ-45, Female
Cable Grade:	Category 5 or better
Cable Type:	UTP 26 to 22 AWG
Stacking Cable:	50-pin shielded cable
Additional Stacking:	Up to 6 hubs maximum
Max. segment length:	100m (328 ft)
Environmental:	
Operating Temp.	0°C to 45°C (32°F to 113°F)
Storage Temp.	-20°C to 60°C (-4°F to 140°F)
Relative Humidity	10% to 90% non-condensing
Electrical:	
Input Voltage:	100-240VAC, 50/60Hz Auto-sense, internal power supply
Output Voltage:	5VDC / 8A
Power Consumption: KNE8TX/RS KNE12TX/RS	 15 Watts maximum 21 Watts maximum
Physical:	
Dimension (H x L x D):	1.70” x 17.32” x 10” (43.2mm x 440mm x 254mm)
Weight: KNE8TX/RS KNE12TX/RS	 8.10 lbs (3.69 kg) 8.18 lbs (3.71 kg)
Certification	
EMI Standards:	FCC Class A, CE CISPR A
EMC Standards:	EN55022, IEC801-2, IEC801-3, IEC801-4
Low Voltage Directive:	EN60950
Safety Standards:	UL, CSA, TUV
Optional Accessories:	

100FX Modules: with SC connectors with ST connectors	Part Numbers: KNE100FX/RSC KNE100FX/RST

Specifications

Fast EtheRx Model: KNE24TX/RS	
Compliance:	IEEE 802.3u 100BASE-TX Standard for 100Mb/s baseband networks
Media Interface:	24 UTP ports for 100BASE-TX connections
Diagnostic LEDs:	24 LEDs for Link (Green), Activity (flashing Green), and Partition (flashing Amber) 1 LED for Collision status (Amber) 1 LED for Power Indicator (Green) 5 LEDs for Utilization Status (steady green) 1 LED for Fiber Module Detection (steady green)
Uplink Port:	Port 24 supports crossover and straight-thru cable
Connector Type:	RJ-45, Female
Cable Type:	UTP 26 to 22 AWG
Cable Grade:	Category 5 or better
Stacking Cable:	50-pin shielded cable
Additional stacking:	Up to 6 hubs maximum
Max. segment length:	100m (328 ft)
Inter-repeater link: No. of repeaters: Cable Length:	 Two (2) Class II repeaters maximum 5 meters (16.4 feet)
Environmental:	
Operating Temp.	0°C to 45°C (32°F to 113°F)
Storage Temp.	-20°C to 60°C (-4°F to 140°F)
Relative Humidity	10% to 90% non-condensing
Electrical:	
Input Voltage:	100VAC - 240VAC, 50/60Hz Auto-sensing, internal power supply
Output Voltage:	5VDC / 8A
Power Consumption:	27W maximum
Physical:	
Dimension (H x L x D):	1.70” x 17.32” x 10” (43.2mm x 440mm x 254mm)
Weight:	9.25 lbs. (4.2 kg)
Certification:	
EMI Standards:	FCC Class A, CE CISPR A, C-Tick
EMC Standards:	EN55022, IEC801-2, IEC801-3, IEC801-4
Low Volt Directive:	EN60950
Safety Standards:	UL, cUL, TUV
Optional Accessories:	

100FX Modules:	Part Numbers:
with SC connectors	KNE100FX/RSC
with ST connectors	KNE100FX/RST

Appendix D Commonly Asked Questions

Class Ⓘ vs. Class Ⓘ Ⓘ 100BASE-TX Fast Ethernet Repeaters

There are currently two classes of Fast Ethernet repeaters, defined as Class Ⓘ and Class Ⓘ Ⓘ.

Class Ⓘ: in a maximum length segment topology, only **one** Class Ⓘ repeater may exist between any two nodes within a single collision domain.

Class Ⓘ Ⓘ: in a maximum length segment topology, **two** Class Ⓘ Ⓘ repeaters may exist between any two nodes within a single collision domain.

Will 100BASE-TX run on Category 3 cable?

No! Category 3 (CAT 3) cabling even in short lengths generates too much near end crosstalk for 100BASE-TX networks. The IEEE 802.3u 100BASE-TX Fast Ethernet standard requires Category 5 100 Ω UTP or 150 Ω STP which complies with ISO/IEC 11801:1995.

What is Category 5?

Category 5 (CAT 5) is a further extension of the EIA/TIA-568 cabling system to 100 MHz. Category 5 components (i.e., UTP trunk and patch cables, modular plug, and patch panel, etc.) are defined by EIA/TIA-568, but with the characterizations extended to 100 MHz by TSB-36 and TSB-40. The cable grades are categorized as follows:

- **Category 3:** up to 16 MHz
- **Category 4:** up to 20 MHz.
- **Category 5:** up to 100 MHz.

Category 5 Compliance vs. Category 5 Performance?

Having CAT 5 components in your network installation does not necessarily achieve full Category 5 performance. To achieve any category-rated performance, make sure all cabling components are at least of the minimum category required.

To achieve full CAT 5 performance, all components must be CAT 5 compliant and terminated properly according to EIA/TIA-568 TSB-36 and TSB-40 guidelines.

What are the Guidelines for Proper Termination?

It is important to maintain the twists of the cable as close to the termination on the outlet as possible, to avoid NEXT (Near End Cross Talk) and to maintain the transmissions characteristics of the Category. Category specifications require that pair twisting be maintained to within the following distances from the outlet termination:

- **Category 3 maximum allowed untwisting:** 3 inches
- **Category 4 maximum allowed untwisting:** 1 inch
- **Category 5 maximum allowed untwisting:** 1/2 inch

Can I mix CAT 3 and CAT 5 cabling in the same building?

Yes, but keep in mind, you will not have CAT 5 performance. It is a good idea to keep the lines separated and when installing any new lines, use CAT 5 UTP cabling only.

Can a Four-Pair CAT 5 cable support two 100BASE-TX devices?

Although only two pairs are used in the standard four-pair CAT 5 UTP cable, it is not recommended because it exceeds the specifications outlined by IEEE 802.3u.

Appendix E Mounting Templates

The Fast EtheRx hubs can be stationed on a flat surface using the four rubber feet provided, or mounted to a standard 19-inch rack by using the mounting brackets on each side of the unit.

Rubber Feet for Desktops

The Fast EtheRx hubs may use rubber feet applied to the bottom of the unit for desktop surfaces or stacking hubs on top of one another. The four (4) rubber feet have peel-off adhesive backing. Remove the backing and attach the feet to the bottom of the hub.

Brackets for Rack Mounting

The Fast EtheRx hubs can also be mounted to a standard 19-inch rack by attaching the angle brackets to each side of the hub. Align the holes in the brackets with the side mount holes on the hub. Use the 8 bracket screws provided to attach the brackets. When the hub is placed into a 19-inch rack, use the 4 large knob rack-mount screws to secure the hub to the rack. See Figure E-1 below:

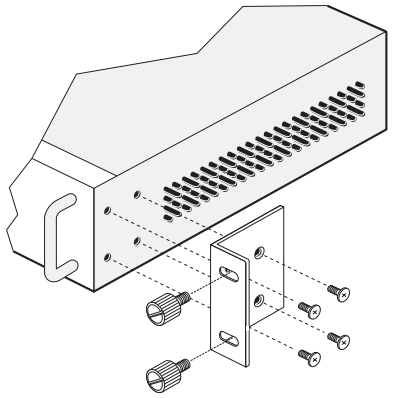


Fig. E-1-Attaching the Mounting Brackets

Appendix F Product Warranties and Notices

Limited Warranty Statement

KINGSTON TECHNOLOGY COMPANY ("Kingston") warrants that this product is free from defects in material and workmanship. Subject to the conditions and limitations set forth below, Kingston will, at its option, either repair or replace any part of this product which proves defective by reason of improper workmanship or materials. Repair parts or replacement products will be provided by Kingston on an exchange basis, and will be either new or refurbished to be functionally equivalent to new.

This warranty does not cover any damage to this product which results from accident, abuse, misuse, natural or personal disaster, or any unauthorized disassembly, repair or modification.

Duration of Warranty

***Lifetime Warranty*:** The following Kingston products are covered by this warranty for life: solid state memory (e.g., memory modules and boards), networking adapters, networking hubs without cooling fans (excluding the power supply), solid state PC Card (PCMCIA) adapters, and microprocessor upgrade products.

***Seven Year Warranty*:** The following Kingston products are covered by this warranty for a period of seven years from the date of original retail purchase: storage enclosures (including the power supply), cables, terminators, and accessories.

Five Year Warranty: The following Kingston products are covered by this warranty for a period of five years from the date of original retail purchase: the power supply in networking hubs without cooling fans; and all other Kingston products (other than those products covered by a three-year, two-year, or one-year warranty, as provided below).

Three Year Warranty: The following Kingston products are covered by this warranty for a period of three years from the date of original retail purchase: networking hubs with cooling fans (including the power supply).

Two Year Warranty: The following Kingston products are covered by this warranty for a period of two years from the date of original retail purchase: Solid State Floppy Disk Cards (SSFDC), and Winchester hard disk drives in a 2.5 inch, 3.5 inch or 5.25 inch form factor.

***One Year Warranty*:** The following Kingston products are covered by this warranty for a period of one year from the date of original retail purchase: Winchester hard disk drives in a 1.8 inch form factor, optical storage products, and magnetic tape storage products.

Warranty Claim Requirements

To obtain warranty service, return the defective product, freight prepaid and insured, to your local authorized Kingston dealer or distributor, or to the Kingston factory service center located at 17600 Newhope Street, Fountain Valley, California 92708, U.S.A. You must include the product serial number (if applicable) and a detailed description of the problem you are experiencing. You must also include proof of the date of original retail purchase as evidence that the product is within the applicable warranty period. If you return the product directly to the Kingston factory, you must first obtain a Return Material Authorization ("RMA") number by calling Kingston Customer Service at (714) 438-1810, and include the RMA number prominently displayed on the outside of your package. Products must be properly packaged to prevent damage in transit.

Free Technical Support

Kingston provides free technical support. If you experience any difficulty during the installation or subsequent use of a Kingston product, please contact Kingston's Technical Support department prior to servicing your system.

Kingston Technical Support can be reached in the U.S. at (714) 435-2639 or toll-free at (800) 435-0640 (U.S. and Canada only). Kingston European Technical Support can be reached from within the U.K. at 01932 738858. Kingston provides other service numbers when calling from Germany 0130 115 639 or fax 0130 860 599, from Austria 0660 5569 or fax 06 607 434, from Switzerland 0800 557 748 or fax 0800 552 182, from France 0800 905 701 or fax 0800 900 910, or from Belgium (in English) 0800 72763.

This warranty covers only repair or replacement of defective Kingston products, as provided above. Kingston is not liable for, and does not cover under warranty, any costs associated with servicing and/or the installation of Kingston products.

Disclaimers

The foregoing is the complete warranty for Kingston products and supersedes all other warranties and representations, whether oral or written. Except as expressly set forth above, no other warranties are made with respect to Kingston products and Kingston expressly disclaims all warranties not stated herein, including, to the extent permitted by applicable law, any implied warranty of merchantability or fitness for a particular purpose. In no event will Kingston be liable to the purchaser, or to any user of the Kingston product, for any damages, expenses, lost revenues, lost savings, lost profits, or any other incidental or consequential damages arising from the purchase, use or inability to use the Kingston product, even if Kingston has been advised of the possibility of such damages.

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F.C.C. Certification

This device has been tested and found to comply with limits for Class A digital device, pursuant to Part 15 of the FCC Rules. Operation is subject to the following conditions:

(1) This device may not cause harmful interference, and
(2) This device must accept any interference received; including interference that may cause undesired operation.

CE Notice

The official CE symbol indicates compliance of this Kingston Technology product to the EMC directive of the European Community. The CE symbol found here or elsewhere indicates that this Kingston product meets or exceeds the following standards:

- **EN50081-1** "Electromagnetic Compatibility-generic emissions standard"
  EN55022: "Limits and methods of measurement of radio interference characteristics."
- **EN50082-1** "Electromagnetic Compatibility-generic immunity standard"
  IEC 801-2: "Electrostatic discharge requirements"
  IEC 801-3: "Radiated immunity requirements"
  IEC 801-4: "Electrical fast transient requirements"
- **EN60950** "Low Voltage Directive (LVD)"
- **Declaration of CE Conformity** in accordance with the above standards has been made and is on file at Kingston Technology.

CE